

WHAT IS CLAIMED IS:

1. An antenna arrangement for detecting a wireless article comprising:
 - a first antenna loop disposed in a first plane for transmitting and/or receiving electromagnetic signals;
 - a first tunable circuit connected to said first antenna loop for coupling at least received signals therefrom;
 - a second antenna loop disposed at least in part in the first plane and overlapping at least in part said first antenna loop therein,
 - wherein said first and second antenna loops overlap at least in part in the first plane and define a detection region adjacent thereto in which said first and second antenna loops transmit and/or receive electromagnetic signals with a component of an associated electromagnetic field in each of three mutually orthogonal directions and in which a wireless article may be;
 - a second tunable circuit connected to said second antenna loop for coupling at least received signals therefrom; and
 - a processor coupled to said first and second tunable circuits for processing at least received signals from said first and second antenna loops for detecting a wireless article in the detection region.
2. The antenna arrangement of claim 1 wherein at least part of said second antenna loop is in a second plane and the angle at which the first and second intersecting planes intersect is between about 80° and about 100°.
3. The antenna arrangement of claim 1 wherein said first and second tunable circuits each includes at least one of a tuning circuit and a filter for selectively connecting said first and second antenna loops and said processor.

4. The antenna arrangement of claim 1 in combination with a wireless article including a loop antenna and an electronic device including a memory, wherein said processor processes received signals of a type produced by the electronic device and transmitted via the wireless article loop antenna.
5. The antenna arrangement of claim 1 wherein said processor processes transmitted signals and the received signals, wherein the transmitted signals are coupled by said first and second tunable circuits to said first and second antenna loops to be transmitted thereby.
6. The antenna arrangement of claim 5 in combination with a wireless article including a loop antenna and an electronic device including a memory, wherein said processor processes transmitted signals of a type received by the electronic device via the wireless article loop antenna and processes received signals of a type produced by the electronic device and transmitted via the wireless article loop antenna.
7. The antenna arrangement of claim 6 wherein the signals received by the electronic device activate, operate, and/or control the electronic device and cause storing of information in the memory and/or reading of information from the memory.
8. The antenna arrangement of claim 1 in combination with a utilization system operable in conjunction with transmitted signals and the received signals for toll collection, object identification, stolen object identification, theft prevention, object tracking, package tracking, baggage tracking, medication dispensing and/or usage, medical device dispensing and/or usage, retailing, inventory tracking, factory and/or warehouse inventory, security identification, and/or access control.

9. The antenna arrangement of claim 1 wherein the detection region includes a portal, a passage, a passageway, a doorway, an access, an egress, a security gate, a toll gate, an electronic gate, a retail check-out station, a hospital, a medical facility, a pharmacy, a location at which medication and/or a medical device is dispensed and/or used, a corridor, a tunnel, a conveyor, a trough, a baggage cart, an enclosure, a storage space, a container, a shipping container, a pallet, a cargo bay, a truck, a trailer, a loading area, and/or a warehouse.
10. An antenna arrangement for detecting a wireless article in a detection region comprising:
 - a first antenna loop disposed in a first plane for transmitting and/or receiving electromagnetic signals;
 - a first tunable circuit connected to said first antenna loop for coupling at least received signals therefrom;
 - a second antenna loop disposed at least in part in the first plane and overlapping at least in part said first antenna loop therein,
 - wherein said first and second antenna loops overlap at least in part in the first plane and define a detection region adjacent thereto in which said first and second antenna loops transmit and/or receive electromagnetic signals with a component of an associated electromagnetic field in each of three mutually orthogonal directions and in which a wireless article may be;
 - a second tunable circuit connected to said second antenna loop for coupling at least received signals therefrom; and
 - electrical conductors connected to said first and second tunable circuits for coupling at least received signals from said first and second antenna loops for detecting a wireless article in the detection region.
11. The antenna arrangement of claim 10 wherein at least part of said second antenna loop is in a second plane and the angle at which the first and second intersecting planes intersect is between about 80° and about 100°.

12. The antenna arrangement of claim 10 wherein said first and second tunable circuits each includes at least one of a tuning circuit and a filter for selectively connecting said first and second antenna loops and said electrical conductors.
13. The antenna arrangement of claim 10 in combination with a wireless article including a loop antenna and an electronic device including a memory, wherein said first and second antenna loops receive signals of a type produced by the electronic device and transmitted via the wireless article loop antenna.
14. The antenna arrangement of claim 10 in combination with a wireless article including a loop antenna and an electronic device including a memory, wherein said first and second antenna loops transmit signals of a type received by the electronic device via the wireless article loop antenna and receive signals of a type produced by the electronic device and transmitted via the wireless article loop antenna.
15. The antenna arrangement of claim 14 wherein the signals received by the electronic device activate, operate, and/or control the electronic device and cause storing of information in the memory and/or reading of information from the memory.
16. The antenna arrangement of claim 10 in combination with a utilization system operable in conjunction with transmitted signals and the received signals for toll collection, object identification, stolen object identification, theft prevention, object tracking, package tracking, baggage tracking, medication dispensing and/or usage, medical device dispensing and/or usage, retailing, inventory tracking, factory and/or warehouse inventory, security identification, and/or access control.

17. The antenna arrangement of claim 10 wherein the detection region includes a portal, a passage, a passageway, a doorway, an access, an egress, a security gate, a toll gate, an electronic gate, a retail check-out station, a hospital, a medical facility, a pharmacy, a location at which medication and/or a medical device is dispensed and/or used, a corridor, a tunnel, a conveyor, a trough, a baggage cart, an enclosure, a storage space, a container, a shipping container, a pallet, a cargo bay, a truck, a trailer, a loading area, and/or a warehouse.
18. A method for detecting a wireless article in a detection region comprising:
 - providing at least first and second loop antennas;
 - disposing the first loop antenna in a first plane and disposing the second loop antenna at least in part in the first plane, wherein said first and second loop antennas overlap at least in part in the first plane, thereby to define a detection region adjacent thereto in which a wireless article may be;
 - causing the at least first and second loop antennas to transmit and/or receive electromagnetic signals having a component of an associated electromagnetic field in each of three mutually orthogonal directions for signaling with a wireless article in the detection region;
 - coupling the at least first and second loop antenna and a processor via first and second tunable circuits for receiving signals from the wireless article and/or for transmitting signals to the wireless article; and
 - processing in the processor the received and/or transmitted signals for detecting a wireless article in the detection region.
19. The method of claim 18 wherein said coupling includes tuning, filtering and/or selectively connecting the first and second loop antennas.
20. The method of claim 19 wherein said selectively connecting includes one of sequentially connecting ones of the plurality of antenna loops and the processor and alternately connecting ones of the plurality of antenna loops and the processor.

21. The method of claim 18 further comprising:
- providing at least one wireless article including a loop antenna and an electronic device including a memory,
 - wherein said processing includes processing transmitted signals of a type received by the electronic device via the loop antenna of the wireless article and processing received signals of a type produced by the electronic device and transmitted via the wireless article loop antenna.
22. The method of claim 18 wherein said processing comprises coupling signals related to the transmitted and/or received signals for performing toll collection, object identification, stolen object identification, theft prevention, object tracking, package tracking, baggage tracking, medication dispensing and/or usage, medical device dispensing and/or usage, retailing, inventory tracking, factory and/or warehouse inventory, security identification, and/or access control.
23. The method of claim 18 wherein the detection region includes a portal, a passage, a passageway, a doorway, an access, an egress, a security gate, a toll gate, an electronic gate, a retail check-out station, a hospital, a medical facility, a pharmacy, a location at which medication and/or a medical device is dispensed and/or used, a corridor, a tunnel, a conveyor, a trough, a baggage cart, an enclosure, a storage space, a container, a shipping container, a pallet, a cargo bay, a truck, a trailer, a loading area, and/or a warehouse.
24. An antenna arrangement for detecting a wireless article in a detection region comprising:
- a loop antenna formed of a loop conductor, wherein the loop conductor of said loop antenna is disposed in a plane and crosses over itself at least at three locations in the plane, thereby to define a pretzel-like shape in the plane,
 - wherein said loop antenna defines a detection region adjacent the plane in which detection region said loop antenna transmits and/or receives electromagnetic signals with a component of an associated electromagnetic field in each of three

mutually orthogonal directions and in which a wireless article may be;

a processor for providing signals to be transmitted by said loop antenna and for processing signals received from said loop antenna for detecting a wireless article in the detection region; and

a tunable filter circuit for coupling said loop antenna and said processor, whereby signals provided by said processor are transmitted by said loop antenna and signals received by said loop antenna are coupled to said processor for detecting a wireless article in the detection region.

25. A method for detecting a wireless article in a detection region of a loop antenna comprising:

providing a loop antenna formed of a loop conductor disposed in a plane and crossing over itself at least twice in the plane,

wherein the loop antenna defines a detection region adjacent the plane in which detection region said loop antenna transmits and/or receives electromagnetic signals with a component of an associated electromagnetic field in each of three mutually orthogonal directions and in which a wireless article may be;

causing the loop antenna to transmit and/or receive electromagnetic signals having a component of an associated electromagnetic field in each of three mutually orthogonal directions for signaling with a wireless article in the detection region;

providing a processor;

coupling the loop antenna and the processor for receiving signals from the wireless article and/or for transmitting signals to the wireless article; and

processing the received and/or transmitted signals for detecting a wireless article in the detection region.